Travis M. Falconer

EDUCATION

University of North Carolina Chapel Hill, NC 27599
Ph.D., Analytical/Physical Chemistry, August, 2008
"*Ion Capture in Helium Droplets: Formation of Cold Ion-Neutral Clusters*"

University of North Dakota Grand Forks, ND 58202
B.S., Chemistry, *magna cum laude*, May, 2002

SCIENTIFIC EXPERIENCE

U.S. Food and Drug Administration, Cincinnati, OH August, 2010 – Present
Chemist GS-1320/13-6

- Research and development of improved methods for detection and identification of harmful substances utilizing current LC and MS technologies
- Identification and quantitation of active pharmaceutical ingredients and/or adulterants in food, drugs, dietary supplements, and other samples by LC/MS analysis
- Provide expert testimony regarding chemical analyses of foods, drugs, and dietary supplements
- Instructor for FDA ORAU training courses LB403, "Advanced Mass Spectrometry," and LB511, "FDA/FERN-C Training for LC/MS"
- Development and administration of paperless data reporting and storage system
- Automated Laboratory Management (ALM) Coordinator
- Maintain and troubleshoot LC/MS systems

University of North Carolina, Chapel Hill, NC June, 2008 – June, 2010
Postdoctoral Researcher with Professor J. Michael Ramsey

- Developed micron-scale cylindrical ion trap (CIT) mass spectrometers that are 20 times smaller than commercial instruments
- Designed and fabricated CIT arrays for reduced capacitance and improved sensitivity
- Demonstrated ion detection with Faraday cup in conjunction with micron-scale CIT mass spectrometer arrays
- Designed circuits and programmed software for data acquisition and instrument control
- Performed computer modeling of miniature CIT mass spectrometer performance

University of North Carolina, Chapel Hill, NC Aug., 2002 – June, 2008
Graduate Research Assistant with Professors Roger E. Miller and Gary L. Glish

- Developed a temperature-programmed desorption apparatus for studying the deposition of materials by superfluid helium nanodroplets
- Performed electron ionization/Penning ionization mass spectrometry and infrared spectroscopy of Na-HCN complexes in helium nanodroplets
- Made first observation of ion-neutral complexes solvated in helium droplets, specifically Na^+ with H_2O, HCN, and N_2
- Used helium droplets to produce largest sodiated water clusters observed in the gas phase to date
- Performed ab initio calculations to demonstrate that ion-neutral cluster formation will overcome the helium "snowball" surrounding the cation
- Designed experiment that determined the size of helium droplets required to capture high energy alkali cations to be greater than 50,000 He atoms

Los Alamos National Laboratory (LANL), Los Alamos, NM Summer, 2002
Research Scientist under Dr. Brian K. Bluhm

- Used inductively-coupled plasma mass spectrometry to perform elemental analysis
- Development of technique for analyzing byproducts of nuclear processes

SCIENTIFIC EXPERIENCE (cont.)

University of North Dakota, Grand Forks, ND Aug., 2000 - May, 2002
Undergraduate Research Assistant with Professor Anthony J. Borgerding

- Optimized operation of quadrupole mass spectrometer
- Implemented Membrane Introduction Mass Spectrometry (MIMS) following the work done at LANL in 1999 and 2000
- Added cryo-trapping technology to MIMS to improve limit of detection by a factor of five

Los Alamos National Laboratory, Los Alamos, NM Summers of 1999 and 2000
Undergraduate Research Assistant with Dr. Charles W. Wilkerson, Jr.

- Studied MIMS for near real-time detection of volatile organic compounds in water and air
- Collected, analyzed, and organized data for publication
- Presented results of research to LANL division leaders

MEMBERSHIPS

- American Chemical Society, 2001-present
- American Society for Mass Spectrometry, 2006-present
- Triangle Area Mass Spectrometry Group, 2006-2010

COMMITTEES

- Chemical Methods Validation Subcommittee of the FDA Chemical Research Coordination Group, 2018-present
- American Society for Mass Spectrometry Education Committee, 2016-2018
- University of Tampa Forensic Science Advisory Board, 2015
- Forensic Chemistry Center Research Steering Committee, 2014-2016

AWARDS

- Commissioner's Special Citation – Mozambique Pombe Chemical/Microbiological Analytical Team (2016)
- Finalist: Donald C. Mackel Award for Excellence in Epidemiology and Laboratory Science – "Undetermined Risk Factors for Severe Illness and Death Among Funeral Attendees – Mozambique, 2015," 65th Annual Epidemic Intelligence Service (EIS) Conference, CDC (2016)
- Honor Award – Undeclared Anabolic Steroids in Vitamin B Supplements (2014)
- Individual Award – Scientific and professional contributions to achieve agency goals (2013)
- Group Recognition Award – Oxy Elite Supplement/Acute Liver Failure Group (2013)
- Group Recognition Award – Scientific Data Management Systems Team (2013)
- Recognition Award – Operation Shady Supplement Sample Analysis (2012)
- Recognition Award – First OCI Counterfeit Tobacco Case at FCC (2012)
- Group Recognition Award – Counterfeit Alli Weight Loss Medication Team (2011)
- Outstanding Intercenter Scientific Collaboration – Deepwater Horizon Oil Spill Emergency Chemical Response Team (2011)
- Group Recognition Award – Deepwater Horizon Oil Spill Response Team (2011)

PUBLICATIONS

- **Falconer, T.M.**; Flurer, R.A.; Jones, M.B.; Lorenz, L.M.; Voelker, S.E. "Identification of the Anabolic Steroid 6β-Chlorotestosterone in a Dietary Supplement." *Drug Testing and Analysis*, **2018**; doi: 10.1002/dta.2510.
- Lanzarotta, A.; Lorenz, L.; Voelker, S.; **Falconer, T.M.**; Batson, J. "Forensic Drug Identification, Confirmation, and Quantification Using Fully Integrated Gas Chromatography with Fourier Transform Infrared and Mass Spectrometric Detection (GC-FT-IR-MS)." *Applied Spectroscopy*, **2018**, 72, 750-756; doi: 10.1177/0003702817746964.
- Samo Gudo, E. et al. "Description of a Mass Poisoning in a Rural District in Mozambique: The First Documented Bongkrekic Acid Poisoning in Africa." *Clinical Infectious Diseases*, **2018**, *66*, 1400-1406; doi: 10.1093/cid/cix1005.

PUBLICATIONS (cont.)

- **Falconer, T.M.**; Kern, S.E.; Brzezinski, J.L.; Turner, J.A.; Boyd, B.L.; Litzau, J.J. "Identification of the Potent Toxin Bongkrekic Acid in a Traditional African Beverage Linked to a Fatal Outbreak." *Forensic Science International*, **2017**, *270*, e5-e11; doi: 10.1016/j.forsciint. 2016.10.015.
- Kubachka, K.M.; Hanley, T.; Mantha, M.; Wilson, R.A.; **Falconer, T.M.**; Kassa, Z.; Oliveira, A.; Landero, J.; Caruso, J. "Evaluation of selenium in dietary supplements using elemental speciation." *Food Chemistry*, **2017**, *218*, 313-320; doi: 10.1016/j.foodchem.2016.08.086.
- Lanzarotta, A.; **Falconer, T.**; McCauley, H.; Lorenz, L.; Albright, D.; Crowe, J.; Batson, J. "Simultaneous Orthogonal Drug Detection using Fully Integrated Gas Chromatography with Fourier Transform Detection and Mass Spectrometric Detection." *Applied Spectroscopy*, **2017**, *71*, 1050-1059; doi: 10.1177/0003702816668534.
- Nnaji, C.C.; Mach, P.M.; Acheampong, J.S.; **Falconer, T.M.**; Verbeck G.F. "Analysis of trace amounts of adulterants found in powders/supplements utilizing Raman spectroscopy coupled to direct analyte-probed nanoextraction-nanospray ionization-mass spectrometry." *Analytical Methods*, **2016**, *8*, 4798-4807; doi: 10.1039/C6AY00828C.
- **Falconer, T.M.**; Lewis, W.K.; Bemish, R.J.; Miller, R.E.; Glish, G.L. "Formation of cold ion-neutral clusters using superfluid helium nanodroplets." *Review of Scientific Instruments,* **2010**, *81*, 054101/1-054101/6; doi: 10.1063/1.3386584.
- Choi, M.Y.; Douberly, G.E.; **Falconer, T.M.**; Lewis, W.K.; Lindsay, C.M.; Merritt, J.M.; Stiles, P.L.; Miller, R.E. "Infrared spectroscopy of helium nanodroplets: novel methods for physics and chemistry." *International Reviews in Physical Chemistry,* **2006**, *25*, 15-75; doi: 10.1080/ 01442350600625092.
- Allen, T.M.; **Falconer, T.M.**; Cisper, C.E.; Borgerding, A.J.; Wilkerson, C.W. "Real-Time Analysis of Methanol in Air and Water by Membrane Introduction Mass Spectrometry." *Analytical Chemistry,* **2001**, *73*, 4830-4835; doi: 10.1021/ac010315c.

INVITED TALKS

- **Falconer, T.M.** "*Mass Spectrometry for Food and Drug Forensics*," CFSAN/ORS MS Discussion Group; Sept. 20, 2017.
- **Falconer, T.M.** "*Forensic Analysis of a Mass Poisoning in Mozambique Associated with a Homebrewed Beverage*," 2017 FDA Science Forum; May 31, 2017.
- **Falconer, T.M.** "*Tainted Goods: Tales of Adulterated Dietary Supplements*," Cincinnati Section of the American Chemical Society; Feb. 23, 2017.
- **Falconer, T.M.** "*Non-Targeted Screening of Foods for Chemical Contaminants*," 2017 Meeting of the Pacific Southwest Section of AOAC, International; Feb. 15, 2017.
- **Falconer, T.M.** "*Non-Targeted Mass Spectrometric Analysis of Dietary Supplements*," 47th Central Regional Meeting of the American Chemical Society, May 18-21, 2016.
- **Falconer, T.M.** "*Protecting Consumers One Analysis at a Time: Identifying Harmful Adulterants in Dietary Supplements*," Pittcon Conference & Expo, Mar. 6-10, 2016.
- **Falconer, T.M.** "*U.S. FDA FERN cCAP Update*," Laboratory Response Network-Chemistry Level One Meeting, Apr. 14-16, 2015.
- **Falconer, T.M.** "*Forensic Chemistry at the U.S. Food & Drug Administration*," Chemistry and Forensic Science Departmental Seminar, Jan. 26, 2015.
- **Falconer, T.M.** "*U.S. FDA FERN cCAP Update*," Laboratory Response Network-Chemistry Level One Meeting, Apr. 15-17, 2014.
- **Falconer, T.M.**; Gamble, B.G. "*Mass Spectrometry in Food Forensics*," 28th Asilomar Conference on Mass Spectrometry, Oct. 5-9, 2012.
- **Falconer, T.M.** "*Rapid Fluoroacetate Detection by High-Resolution Accurate-Mass LC/MS*," 2012 FERN-cCAP Technical Meeting, Sept. 11-13, 2012.
- Wolfe, D.W., **Falconer, T.M.**, Ramsey, J.M. "*Microscale Ion Trap Mass Spectrometry*," meeting of the Triangle Area Mass Spectrometry discussion group, Feb. 17, 2010.
- **Falconer, T.M.**; Wolfe, D.W.; Ramsey, J.M. "*Ion Trap Mass Spectrometry on the Microscale*," Department of Chemistry, Analytical Division Seminar, Nov. 23, 2009.

INVITED TALKS (cont.)

- **Falconer, T.M.**; Lewis, W.K.; Johnson, A.M.; Bemish, R.J.; Glish, G.L.; Miller, R.E. "*Applying Superfluid Helium Nanodroplets to the Study of Ions: New Possibilities*," meeting of the Triangle Area Mass Spectrometry discussion group, June 28, 2006.

ORAL PRESENTATIONS

- Lanzarotta, A.; Kern, S.; **Falconer, T.**; Gaston, K.; Skelton, D.; Lorenz, L.; Voelker, S. "Combating the Opioid Crisis Using Complementary Handheld and Field-Portable Analytical Instruments," 1st ORCE Research Meeting, June 27-28, 2018.
- Kern, S.; **Falconer, T.M.**; Li, F.; Toomey, V.M.; Litzau, J.J. "*Fighting the Opioid Crisis Using Mobile Mass Spectrometry and DART-HRMS*," 66th ASMS Conference on Mass Spectrometry and Allied Topics, June 3-7, 2018.
- Kern, S.E.; **Falconer, T.M.**; Brzezinski, J.L.; Boyd, B.L.; Turner, J.A.; Litzau, J.L. "*Forensic Analysis of a Mass Poisoning in Mozambique Associated with a Homebrewed Beverage Using LC-HRAM-MS and DART-MS*," 64th ASMS Conference on Mass Spectrometry and Allied Topics, June 5-9, 2016.
- Litzau, J.J.; **Falconer, T.M.**; Jones, M.B.; Voelker, S.E. *"Identification of Undeclared Designer Anabolic Steroids in a Vitamin-B Dietary Supplement: Mass Spectral Clues for Forensic Investigation,"* 4th Annual FDA Foods and Veterinary Medicine Science and Research Conference, July 28-29, 2014.
- **Falconer, T.M.**; Ridgeway, M.E.; Bemish, R.J.; Glish, G.L.; Miller, R.E. "*Ultracold Ions in Superfluid Helium Nanodroplets*," 121st NC-ACS Sectional Conference, Apr. 21, 2007.
- **Falconer, T.M.**; Lewis III, W.K.; Johnson, A.M.; Bemish, R.J.; Glish, G.L.; Miller, R.E. "Applying Superfluid Helium Nanodroplets to the Study of Ions: New Possibilities," 120th NC-ACS Sectional Conference, Apr. 22, 2006.
- Douberly, G.E.; **Falconer, T.M.**; Miller, R.E. "*Infrared Laser Spectroscopy of the HCN-Sodium Complex Embedded in a Helium Nanodroplet*," 60th Ohio State University International Symposium on Molecular Spectroscopy, June 20-24, 2005.
- **Falconer, T.M.**; Douberly, G.E.; Miller, R.E. "*Formation of van der Waals Complexes with Alkali Metal Atoms in Helium Nanodroplets*," 60th Ohio State University International Symposium on Molecular Spectroscopy, June 20-24, 2005.
- Anthony Borgerding, Melissa Meyer, Mark Roberge, **Travis Falconer**. "*Rapid Analysis and Monitoring Using HSGC and ITMS*," 28th FACSS National Meeting, Oct. 7-12, 2001.

POSTER PRESENTATIONS

- **Falconer, T.M.**; Kern, S.E.; Voelker, S.E. "*Rapid, In Situ Detection of Synthetic Opioids*," 66th ASMS Conference on Mass Spectrometry and Allied Topics, June 3-7, 2018.
- **Falconer, T.M.**; Taylor, A.M. "*HCD vs rCID for Qualitatively Significant Product Ions*," 29th Annual Lake Louise Tandem Mass Spectrometry Workshop, Dec. 1-3, 2016.
- **Falconer, T.M.**; Taylor, A.M. "*DART-MS Imaging of Adulterated Bread to Suggest Route of Contamination*," SciX 2016, Sept. 18-23, 2016.
- Brzezinski, J.L.; **Falconer, T.M.**; Kern, S.E.; Turner, J.A. "*Microbial Characterization of Pombe Samples Implicated in 75 Deaths in Mozambique, 2015*," ASM Microbe 2016, June 16-20, 2016.
- Voelker, S.E.; Lorenz, L.M.; Jones, M.B.; **Falconer, T.M.**; Flurer, R.A. "*Identification of 6-chlorotestosterone and Other Designer Anabolic Steroids in Dietary Supplements with Semi-Quantitative Content Determination using Surrogate Compounds*," Pittcon Conference & Expo, Mar. 6-10, 2016.
- **Falconer, T.M.**; Voelker, S.E.; Lorenz, L.M.; Jones, M.B.; Litzau, J.J. *"Non-Targeted MS Strategy for Designer Steroid Detection,"* 27th ASMS Sanibel Conference on Mass Spectrometry, Jan. 22-25, 2015.
- Litzau, J.J.; **Falconer, T.M.**; Jones, M.B.; Voelker, S.E. *"Identification of Undeclared Designer Anabolic Steroids in a Vitamin-B Dietary Supplement: Mass Spectral Clues for Forensic Investigation,"* 4th Annual FDA Foods and Veterinary Medicine Science and Research Conference, July 28-29, 2014.

POSTER PRESENTATIONS (cont.)

- Voelker, S.E.; **Falconer, T.M.**; Litzau, J.J.; Lorenz, L.M.; Jones, M.B. "*Isolation, Identification, and Determination of Designer Anabolic Steroids Commonly Found in Dietary Supplements*," 4th Annual FDA Foods and Veterinary Medicine Science and Research Conference, July 28-29, 2014.
- **Falconer, T.M.**; Yanes Santos, E. *"Evaluation of Dissociation Techniques for Non-Targeted Analyte Identification,"* 62nd ASMS Conference on Mass Spectrometry and Allied Topics, June 15-19, 2014.
- Litzau, J.J.; **Falconer, T.M.**; Jones, M.B.; Voelker, S.E. *"Identification of Undeclared Designer Anabolic Steroids in a Vitamin-B Dietary Supplement: Mass Spectral Clues for Forensic Investigation,"* 62nd ASMS Conference on Mass Spectrometry and Allied Topics, June 15-19, 2014.
- Voelker, S.E.; **Falconer, T.M.**; Litzau, J.J.; Lorenz, L.M.; Jones, M.B. "*Isolation, Identification, and Determination of Designer Anabolic Steroids Commonly Found in Dietary Supplements*," The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, March 2-6, 2014.
- Wolfe, D.W.; **Falconer, T.M.**; Sperline, R.P.; Denton, M.B.; Ramsey, J.M. "*High-Pressure CIT Mass Spectrometry with a Solid-State CTIA Detector*," 61st ASMS Conference on Mass Spectrometry and Allied Topics, June 9-13, 2013.
- **Falconer, T.M.**; Roetting II, J.P. "*Simple and Sensitive Analysis for Fluoroacetate in Food Using High Mass Accuracy LC/MS*," 2nd Annual FDA Foods Program Science and Research Conference, Aug. 1-2, 2012.
- **Falconer, T. M.**; Roetting II, J.P. "*Simple and Sensitive Analysis for Fluoroacetate in Food Using High Mass Accuracy LC/MS*," 60th ASMS Conference on Mass Spectrometry and Allied Topics, May 20-24, 2012.
- Wolfe, D.W.; **Falconer, T.M.**; Matteo, J.M.; Ramsey, J.M. "*In Situ Optimization of Microscale Cylindrical Ion Trap Geometry*," 58th ASMS Conference on Mass Spectrometry and Allied Topics, May 23-28, 2010.
- **Falconer, T.M.**; Wolfe, D.W.; McKinney, C.J.; Denton, M.B.; Ramsey, J.M. "*High Pressure Ion Detection for Miniaturized Mass Spectrometers*," 58th ASMS Conference on Mass Spectrometry and Allied Topics, May 23-28, 2010.
- **Falconer, T.M.**; Ridgeway, M.E.; Bemish, R.J.; Glish, G.L.; Miller, R.E. "*Using Superfluid Helium Nanodroplets to Form Ultracold Ions*," 55th ASMS Conference on Mass Spectrometry and Allied Topics, June 3-7, 2007.
- Ridgeway, M.E.; **Falconer, T.M.**; Bemish, R.J.; Glish, G.L.; Miller, R.E. "*Ion Source for Doping of Superfluid Helium Nanodroplets with a High Flux of Low Kinetic Energy Alkali Cations*," 55th ASMS Conference on Mass Spectrometry and Allied Topics, June 3-7, 2007.
- **Falconer, T.M.**; Lewis, W.K.; Johnson, A.M.; Bemish, R.J.; Glish, G.L.; Miller, R.E. "*Applying Superfluid Helium Nanodroplets to the Study of Ions: New Possibilities*," 54th ASMS Conference on Mass Spectrometry and Allied Topics, May 28-June 1, 2006.